Why Birds Eat More in Cold Weather

Environmental temperature (ET) is one of the major factors affecting animal performance. Warm blooded animals including human beings show a range of variability of body temperature (BT) depending on factors such as weather, food intake, activity and light. Hibernation in bears is unique, they pass time by sleeping from 3 to 7 months and they do not eat, drink, urinate, or defecate. Hibernation slows metabolic rate which leads to a reduction in body temperature. They maintain their minimal body temperature by using their stored body fat metabolism and reducing other physiological activities (Toien et al., 2011). Birds use feed energy to maintain body temperature a range of 40.6 to 41.7°C regardless of environmental temperature. When environmental temperature is colder birds lose more body heat to the environment. This affects growth and performance because the energy available for growth changes. Weather helps to understand feed intake.

**Background**

In colder weather birds lose more heat to the environment due to a bigger temperature gap between bird and environment. Birds ate more to maintain body temperature (Fig. 2, 3 & 5) because maintenance energy requirements increased (Fig. 6) in the cold. Warm weather (27°C) increased body temperature (Fig. 5). Birds ate more but gained less in colder weather (Fig. 3 & 5). Body temperature varied about 2°C between day and night in feed restricted birds due to light, feed and activities (Fig. 7). Hibernating bears decrease body temperature about 5°C (Fig. 4) and metabolic rate about 25%, and heart rate dropped by 77%, reducing heat loss to the environment.

**Objective**

To identify the relationship between environmental temperature, feed consumption and body temperature in birds.

**Measuring body temperature**

Implanted temperature sensors transmit body temperature readings every ten minutes.

**Observations**

- **Fig. 2.** Birds increase feed intake in cold weather ([www.birdsweatherireland.ie](http://www.birdsweatherireland.ie))
- **Fig. 3.** Feed intake, body weight gain of broilers in different environmental temperatures (Smith & Teeter, 1993. J. Agric. Sci. 121:421-25.)
- **Fig. 4.** Body (Tb) and environmental (Ta) temperature of a hibernating bear (Toien et al., 2011. Science. 331:906-909.)
- **Fig. 5.** Environmental T, body T and daily feed intake (ADFI).
- **Fig. 6.** Maintenance energy requirement in birds increased in cold weather.

**Take Home Message**

In cold weather birds lose more heat to the environment. They need more energy to maintain body temperature and other normal physiological functions, so they eat more.

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